



Medical Force Protection: Dominican Republic

Medical Force Protection countermeasures required before, during, and after deployment to the "area" are as follows:

Major Threats

Diarrhea, respiratory diseases, injuries, hepatitis A and E, leptospirosis, malaria, dengue fever, other arthropod-borne infections, sexually transmitted diseases, heat injury, and leishmaniasis. Raw sewage, industrial wastes, agrochemicals, and salt-water intrusion may contaminate water.

Requirements before Deployment

1. **Before Deploying report to Medical to:**
 - a. Ensure your Immunizations are up to date, specific immunizations needed for area: **Hepatitis A, MMR, Polio, Typhoid, Yellow fever, Tetanus (Td), and Influenza.**
 - b. If you have not been immunized against Hepatitis A (two dose series over 6 months) get an injection of Immunoglobulin with the initial Hepatitis A dose.
2. **Malaria Chemoprophylaxis:**

Must include Primaquine terminal prophylaxis (see "Requirements after deployment")

 - a. **Chloroquine 500 mg/week 2 weeks prior to entering the country, and until 4 weeks after departure.**
 - b. **Mefloquine 250 mg/week 2 weeks prior to entering the country, until 4 weeks after departure**
 - c. **Doxycycline 100 mg/day 2 days prior to entering the country, until 4 weeks after departure.**
3. **Get HIV testing if not done in the past 12 months.**
4. **Make sure you have or are issued from unit supply: DEET, permethrin, bednets/poles, sunscreen and lip balm. Treat utility uniform and bednet with permethrin.**

Requirements during Deployment

1. Consume food, water, and ice only from US-approved sources; **"Boil it, cook it, peel it, or forget it".**
2. Involve preventive medicine personnel with troop campsite selection.
3. Practice good personal hygiene, hand-washing, and waste disposal.
4. Avoid sexual contact. If sexually active, use condoms.
5. Use DEET and other personal protective measures against insects and other arthropod-borne diseases. Personal protective measures include but are not limited to proper wear of uniform, use of bed nets, and daily "buddy checks" in tick and mite infested areas.
6. Minimize non-battle injuries by ensuring safety measures are followed. Precautions include hearing and eye protection, enough water consumption, suitable work/rest cycles, acclimatization to environment and stress management.
7. Eliminate food/waste sources that attract pests in living areas.
8. Avoid contact with animals and hazardous plants.

Requirements after Deployment

1. Receive preventive medicine debriefing after deployment.
2. Seek medical care immediately if ill, especially with fever.
3. Get HIV and PPD testing as required by your medical department or Task Force Surgeon.
4. Malaria terminal prophylaxis: Primaquine 15 mg/day beginning on day of departure for 14 days unless G-6 PD deficient

VECTOR RISK ASSESSMENT PROFILE (VECTRAP): Dominican Republic

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1. GEOGRAPHY: **Area** - 48,442 sq. km (18,704 sq. mi.), about the size of Vermont and New Hampshire. **Cities - Capital** - Santo Domingo (pop. 2.4 million). **Other City** - Santiago de los Caballeros (490,000). **Terrain** - Mountainous. **Climate** Maritime tropical.

2. VECTOR-BORNE DISEASES:

a. **Malaria:** Nearly all endemic malaria is falciparum (an occasional case of malariae malaria is reported), but no drug-resistant strains have been detected. Endemic in the Province of Monte Cristi: Guayabin, Pepillo Salcedo; Province of Dajabon: Dajabon, Restauracion; Province of Elias Pina: Banica, Comendador, El Llano; Province of Independencia: Jimani; entire Province of Pedernales. Risk is year-round. Area of risk may be expanding eastward on the northern coast. Approximately 1,100 cases of malaria are officially reported annually, but actual incidence likely is higher. After having been brought under control in the 1960s (21 cases in 1968), malaria resurged during the late 1970s. By 1982, the official annual case total had reached nearly 4,600, but health officials estimated that the true total exceeded 18,000 cases. In May 1990, at least 2 cases occurred among North American tourists in Costa Ambar. Chloroquine resistant *Plasmodium falciparum* (CRPF) is not reported. The risk of acquiring malaria is considered moderate without the proper chemoprophylaxis and would result in a serious loss of combat effectiveness if acquired. An outbreak of malaria was detected from week 31 (1999) in the section of El Salado, Bavaro included in the province of la Altagracia. In the locality of Bavaro, the outbreak ended on week 51, in other localities of section El Salado the outbreak ended on week 52 (1999) or week 1 (2000). The total cases detected were 359. All cases were falciparum malaria and no drug resistance to 4 and 8-aminoquinolines was detected. The vector was *An. albimanus* and no evidence of resistance to Malathion, phenitrothion, and BTi were detected. A total of 3,390 cases of falciparum malaria were reported countrywide in 1999.

b. **Dengue Fever:** Dengue is endemic country-wide. Presumably more common than indicated by official reporting. (Sporadic cases attributed to dengue virus serotype 2 reportedly occurred in Santo Domingo during late 1990, and only 220 cases including 4 cases of DHF/

DSS were officially reported from the Dominican Republic during 1987-1988 when dengue activity in the Caribbean region was relatively high). By 26, September 1995, the Dominican Republic had reported that 197 cases of dengue fever, and 31 cases of DHF had occurred that year. Dengue serotypes 1, 2, and 4 have been circulating in the Caribbean region since the 1990's. Once acquired, dengue would cause a serious loss of combat effectiveness.

c. **ARBOVIRAL FEVERS (Other than Dengue Fever):** Arboviral encephalitides are vectored by several genera of mosquitoes. These zoonotic agents usually circulate erratically with only occasional accidental human infections. Serological evidence of **Eastern and Venezuelan equine encephalitis**, and **St. Louis encephalitis** occurring in humans exists, but current incidence data are not available.

d. **Bancroftian filariasis** (vectored by *Culex quinquefasciatus* mosquitoes) are mainly limited to Santo Domingo area, where infection rates of 10% to 26% have been reported from some outlying towns; may also occur in the central valley - the Cibao - and the north coast.

e. **Mansonellosis** is vectored by biting midges - *Culicoides* species. Sporadic infections occur.

f. **Schistosomiasis:** Presumably year-round; foci of intestinal schistosomiasis (caused by *Schistosoma mansoni*) are widely distributed in the eastern lowlands, and may occur as far west as Jarabacoa. Although relatively few cases are reported, an estimated 200,000 Dominicans may be infected. Infection rates of up to 24 percent have been found in at least 1 major focus. Potential for further spread exists because suitable snail hosts are widespread, and some indigenous cultural habits create conditions conducive for transmission.

g. **Leishmaniasis:** At least 1 small focus exists in the eastern part of the country. Both cutaneous (disseminated) and mucocutaneous leishmaniasis occur, presumably caused by members of the *Leishmania mexicana* complex.

VECTOR RISK ASSESSMENT PROFILE (VECTRAP): Dominican Republic (continued)**3. DISEASE VECTOR INFORMATION:**

a. Vectors for malaria include the mosquitoes, *Anopheles albimanus*, an outdoor feeder with peak biting activity between sunset and midnight. Larvae are found in a wide variety of unshaded water accumulations, including pools, lakes, and lagoons. *An. crucians* has also been incriminated as a vector.

b. Dengue fever is transmitted by *Aedes aegypti*. This is a peridomestic mosquito that prefers to breed in artificial containers near human habitations. It is diurnally active and feeds indoors or out, often biting around the neck or ankles. It typically rests indoors after feeding.

NOTE: All three of the above-mentioned vectors have been reported resistant to the insecticides Dieldrin and Lindane. *An. albimanus* and *Aedes aegypti* have been reported resistant to DDT.

c. Leishmaniasis is transmitted by the bite of an infective sand fly (*Lutzomyia* spp.). Most sand flies are active from dusk to dawn, and have very limited flight ranges. *Lu. christophei* is the presumed vector species in the Dominican Republic.

4. DISEASE AND VECTOR CONTROL PROGRAMS:

a. Malaria chemoprophylaxis should be mandatory. Consult the Navy Environmental Preventive Medicine Unit #2 in Norfolk, VA (COMM: 757-444-7671; DSN: 564-7671; FAX: 757-444-1191; PLAD: NAVENPVNTMEDU TWO NORFOLK VA) for current chemoprophylaxis recommendations.

b. Yellow fever immunizations should be current.

c. The conscientious use of personal protective measures will help to reduce the risk of many vector-borne diseases. The most important personal protection measures include the use of DEET insect repellent on exposed skin, wearing permethrin-treated uniforms, and wearing these uniforms properly. The use of DEET 33% lotion (2 oz. tubes: NSN 6840-01-284-3982) during daylight and evening/night hours is recommended for protection against a variety of arthropods including mosquitoes, sand flies, other biting flies, fleas, ticks and mites. Uniforms should be treated with 0.5% permethrin aerosol clothing repellent (NSN 6840-01-278-1336), per label instructions. NOTE: This spray is only to be applied to trousers and blouse, not to socks, undergarments or covers. Reducing exposed skin (e.g., rolling shirt sleeves down, buttoning collar of blouse, blousing trousers) will provide fewer opportunities for blood-feeding insects and other arthropods. Additional protection from mosquitoes and other biting flies can be accomplished by the use of screened eating and sleeping quarters, and by limiting the amount of outside activity during the evening/night hours when possible. Bednets (insect bar [netting]: NSN 7210-00-266-9736) may be treated with permethrin for additional protection.

d. The malaria vector, *An. albimanus*, is not as adversely effected by insect repellents as other mosquitoes. Nevertheless, use of DEET will lessen biting activity to below transmission threshold.

e. The most important element of an *Aedes aegypti* control program is SOURCE REDUCTION. Eliminating or covering all water holding containers in areas close to human habitation will greatly reduce *A. aegypti* populations. Alternatively, containers may be emptied of water at least once a week to interrupt mosquito breeding. Sand or mortar can be used to fill tree holes and rock holes near encampments.

f. Because the breeding habitats of most sand fly species are not easily identified, not easily accessible, or unknown, control strategies focus mainly on adult sand flies. Peridomestic sand fly species can be controlled by spraying residual insecticides on buildings (including screening on portals of entry) animal shelters, and other adult resting sites. Area chemical control of sylvan sand fly species is impractical. Personal protective measures will reduce sand fly bites and environmental modification (e.g., clearing forests, eliminating rodent burrows/breeding sites, relocating domestic animals away from human dwellings) has been used to reduce local sand fly populations.

g. Expanded Vector Control Recommendations are available upon request.

VECTOR RISK ASSESSMENT PROFILE (VECTRAP): Dominican Republic (continued)**5. IMPORTANT REFERENCES:**

Contingency Pest Management Pocket Guide Technical Information Memorandum(TIM)24. Available from the Defense Pest Management Information Analysis Center (DPMIAC) www.afpmb.org/pubs/tims/ (DSN: 295-7479 COMM: (301) 295-7479). Best source for information on vector control equipment, supplies, and use in contingency situations.

Control of Communicable Diseases Manual-Edited by James Chin. Seventeenth Ed. 2000. Available to government agencies through the Government Printing Office. Published by the American Public Health Association. Excellent source of information on communicable diseases.

Medical Environmental Disease Intelligence and Countermeasures-(MEDIC). January 2002. Available on CD-ROM from Armed Forces Medical Intelligence Center, Fort Detrick, Frederick, MD 21702-5004. A comprehensive medical intelligence product that includes portions of the references listed above and a wealth of additional preventive medicine information.

Internet Sites- Additional information regarding the current status of vector-borne diseases in this and other countries may be found by subscribing to various medical information sites on the internet. At the Centers of Disease Control and Prevention home page subscriptions can be made to the Morbidity and Mortality Weekly Report(MMWR)and the Journal of Emerging Infectious Diseases. The address is www.cdc.gov. The World Health Organization Weekly Epidemiology Report (WHO-WER) can be subscribed to at www.who.int/wer. The web site for PROMED is <http://www.promedmail.org/>.

Although PROMED is not peer reviewed, it is timely and contains potentially useful information. The CDC and WHO reports are peer reviewed. Information on venomous arthropods such as scorpions and spiders as well as snakes, fish and other land animals can be found at the International Venom and Toxin Database website at <http://www.kingsnake.com/toxinology/>. Information on anti-venom sources can also be found at that site. Information on Poisonings, Bites and Envenomization as well as poison control resources can be found at www.invivo.net/bg/poison2.html.

USERS OF THIS VECTRAP: Please notify NDVECC Jacksonville, or the appropriate NEPMU, if you acquire any medical entomology information that can be used to update this VECTRAP.

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ADDITIONAL INFORMATION ON DISEASE VECTOR SURVEYS, CONTROL AND SPECIMEN ID's WILL BE PROVIDED UPON REQUEST.